



A career guide specially designed
for middle and high school youth

Yes. There is a health career for you!



Produced by

**North Carolina
Health Careers
Access Program**

University of North
Carolina at Chapel Hill
301 Pittsboro Street
Suite 351 • CB# 8010
Tate Turner Kuralt Bldg.
Chapel Hill, NC
27599-8010

TEL: (919) 966-2264
FREE!: (877) 962-4227
FAX: (919) 966-6109
WEB: nchcap.unc.edu

In support of its mission,
NC-HCAP created this
booklet to provide health
career information and
career planning tips to
under-represented middle
and high school students
interested in pursuing
careers in the health and
biomedical sciences.

Information contained in
this booklet was obtained by
over 100 health professions
associations, the U.S. Bureau
of Labor Statistics, NC Area
Health Education Centers
Program, NC Employment
Security Commission, and
Career Explorer.

Comments welcome at
rhking@email.unc.edu.

Introduction

So, you think you might be interested in pursuing a health career? Then you're just the person we want to talk with.



The North Carolina Health Careers Access Program (NC-HCAP) is an inter-institutional program of the University of North Carolina with its central office located on the campus of the University of North Carolina at Chapel Hill.

Our mission is to increase the number of people from educationally or economically disadvantaged backgrounds, with an emphasis on under-represented minorities (African-Americans, Native Americans, Hispanics and Latinos, and Asians/Pacific Islanders of the Vietnam War Era) who are trained, educated and employed in the health professions. We do this by:

- increasing awareness of career opportunities in the health professions;
- cultivating interests in pursuit of health professions;
- enhancing opportunities to gain access to formal training and education programs in the health professions; and
- increasing the probability of success in completing formal training and education programs in the health professions.

Each year the NC-HCAP staff speaks with hundreds of young people just like yourself about career opportunities in the field of health science. Why? Because right now, today, there is **no other** field with a greater demand for skilled professionals, particularly persons from African-American, Native American, Hispanic, Latino or Asian/Pacific Island backgrounds.

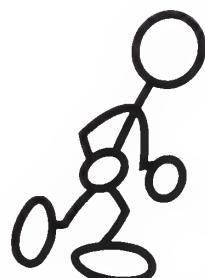
If you're interested in learning more about what it takes to become a health professional, then this booklet will give you a jump start. If you would like to receive more information on any of the careers listed, or wish to receive information on a health career that's *not* listed, call the NC-HCAP Recruiter **toll free at 1-877-962-4227 (1-877-9NC-HCAP)**. She'll be glad to help you.

Are you ready?

Excellent!

Let's get started.

CMH-HC-Know 2000 Center
5515 Security Lane, Suite 101
Rockville, MD 20852
1-800-444-6472



"Just the Facts, Ma'am."

Look no further! Health care is the fastest growing market in the world, with more jobs than any other field. (Take a peek at the Classified section of your local newspaper and you'll see what we mean.) Skilled health professionals, in all disciplines, and particularly from African-American, Native American and Hispanic or Latino backgrounds, are in demand all over the U.S. Here's why:

FACT

Our country is becoming increasingly more diverse. We need health care professionals who are skilled in responding to the unique needs of people from different cultures.

FACT

Our country is getting older. It is estimated that one person in the U.S. turns 50 every eight seconds. The need for varying health services will rise steadily and rapidly over the next several decades.

FACT

Our state needs practitioners of color. In 1996,

- 55 of NC's 100 counties were without **dentists** of color
- 58 of NC's 100 counties were without **pharmacists** of color
- 76 of NC's 100 counties were without **physical therapists** of color
- 92 of NC's 100 counties were without **optometrists** of color*

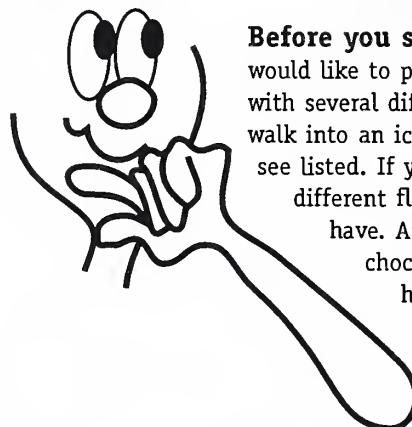
Need we say more?



*Source: DATAline '97,
NC Health Careers Access Program,
University of North Carolina at
Chapel Hill.

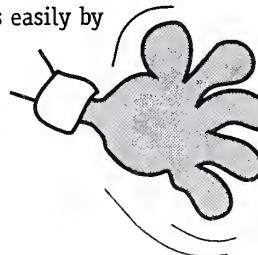
Getting Started

Learn about the professions



Before you start thinking about what *kind* of health career you would like to pursue, you should first take time to familiarize yourself with several different health occupations. After all, you probably don't walk into an ice cream parlor and buy a cone from the first flavor you see listed. If you're like most people, you take a long look at all the different flavors before deciding on the one that you'd really like to have. And what happens if you have a craving for mint chocolate chip and that flavor is sold out? Chances are, you have a backup flavor in mind. The point is, there are many, many different professions in the health field. Don't cheat yourself by knowing about only one or two career possibilities.

You might be thinking, since there *are* so many health careers, how can I make sense of them all? Good question. There are 12 major categories of professions which are frequently used to define the different health science disciplines. You can remember these categories easily by remembering **MODVOPPP + 4**.



Now you're probably saying to yourself, OK, these are the categories, but I haven't a clue what is meant by allopathic or osteopathic medicine or even chiropractic medicine. What do these categories mean?!

Since you've been so brave to ask, let's define these fields the easy way.

- M = MEDICINE:** The science and art of treating and preventing **disease**.
- O = OPTOMETRY:** The profession of testing and examining the **eyes** and prescribing glasses to correct vision problems.
- D = DENTISTRY:** The profession of caring for and repairing **teeth**.
- V = VETERINARY MEDICINE:** The branch of medicine dealing with **animals**.
- O = OSTEOPATHIC MEDICINE:** A school of medicine and surgery that emphasizes the **interrelationship of muscles and bones**.
- P = PHARMACY:** The profession of preparing **drugs and medicines**.
- P = PODIATRIC MEDICINE:** The profession dealing with the care and treatment of **feet**.
- P = PUBLIC HEALTH:** The science and practice of improving the **health and welfare of all people** by preventing and controlling disease.
- 1. = ALLIED HEALTH:** In general, allied health refers to a wide range of occupations that **carry out or assist in the diagnosis, therapy, or the administration of patient care**.

M = Medicine (allopathic)

O = Optometry

D = Dentistry

V = Veterinary Medicine

O = Osteopathic Medicine

P = Pharmacy

P = Podiatry

P = Public Health

+ 4

1. = Allied Health

2. = Chiropractic Medicine

3. = Nursing

4. = Social Work

Getting Started

2. **CHIROPRACTIC MEDICINE:** A method of treating disease by manipulation of the body joints, especially the spine.
3. **NURSING:** Nurses care for patients in hospitals, work in doctor's offices, or teach preventive health care to people in the community and in the workplace. Nurses are important to the care of persons who are recovering from illness or accidents, as well as the maintenance of health.
4. **SOCIAL WORK:** Social workers are mental health professionals concerned with the psychological, emotional and social health of individuals and groups. They work with people who have family and life problems, traumatic experiences, drug or alcohol addiction, developmental disabilities and serious behavioral or psychological disorders.

Most health care professionals can be categorized under one of the major MODVOPPP + 4 disciplines. Below is a quick breakdown of how a sampling of health occupations are categorized using **MODVOPPP + 4**. Remember, this is just a sample!

MEDICINE

- Family Physician
- General Internist
- Obstetrician and Gynecologist
- Cardiologist
- Ophthalmologist
- Pathologist
- Psychiatrist
- Radiologist
- Physician Assistant

OPTOMETRY

- Optometrist
- Optician

DENTISTRY

- Dentist
- Dental Hygienist
- Dental Laboratory Technologist

VETERINARY MEDICINE

- Veterinarian
- Veterinary Technician

OSTEOPATHIC MEDICINE

- Osteopathic Physician

PHARMACY

- Pharmacist

PODIATRIC MEDICINE

- Podiatrist

PUBLIC HEALTH

- Biostatistician
- Environmental Health Specialist
- Epidemiologist
- Health Educator
- Health Services Administrator
- Nutritionist
- Public Health Professional

ALLIED HEALTH

- Clinical Laboratory Scientist
- Cytotechnologist
- Genetic Counselor
- Occupational Therapist
- Physical Therapist
- Radiologic Technologist
- Speech Language Pathologist
- Audiologist

CHIROPRACTIC MEDICINE

- Chiropractor

NURSING

- Nurse Anesthetist
- Nurse Midwife
- Nurse Practitioner

SOCIAL WORK

- Social Worker

How HOT is your career thermometer?

What do you expect from or hope for in a career?

Check as many as apply.

I want my career to...

...be more than just a job.
 ...be challenging with something new always happening.

...be personally as well as financially rewarding.

...provide opportunities for personal and professional growth.

...make a positive impact on the community in which I live and work.

If you checked any of the above, then a career in health may be just what you're looking for.



"No, Sir. Health care isn't all blood and guts."

Health care professionals can be found almost everywhere, not only in the obvious places such as hospitals and dental offices, but in neighborhood drug stores, optical centers, research centers, corporate businesses, public and private schools, colleges and universities, retirement communities, sports associations, health clubs, state and local government offices, and the list goes on and on. Many health care professionals have little, if any, hands-on patient contact. So, if the thought of blood and guts has turned you off to health care, think again! You may be pleasantly surprised at career opportunities in allied health, public health, medical illustration, biomedical photography, scientific writing or health information management.

Does the MODVOPPP + 4 include *all* the health professions? Heavens, no! Hundreds of career opportunities exist outside the MODVOPPP + 4, in specialized fields such as medical instrumentation, health information and communications, special technologies and services and more. With so many health professions to choose from, you owe it to yourself to learn as much as you can about several careers so you can find the one that's right for you.



I'm not a "people person" and I'm not comfortable around sick people. How can I become a health professional?

There are health professions that do not involve a lot of personal contact. Research scientists, medical illustrators, scientific writers, optical laboratory mechanics, health physicists, industrial hygienists and biostatisticians are examples of these. If you choose a career that does involve direct patient interaction, your training will prepare you for contact with sick or injured people. The satisfaction of using your special knowledge to help them will override your initial discomfort. After all, it's the unknown that is scary, so the more you know about what you are doing, the more comfortable and confident you will feel.

I'm interested in becoming a health professional but worry that I'll catch a fatal disease. Help!

Health care has some risks, but even where they exist there are many precautions taken to keep risk a minimum. In fact, safety is a very important part of your training as a health care professional.

Health Careers: A Closer Look at Medicine

Allopathic Medicine

Physician

Physicians, or doctors, diagnose and treat illnesses and injuries and teach people how to improve their health habits. Physicians may specialize in many areas of medicine; some of these are listed below. Depending on their specialty areas, they diagnose and treat illness of children and/or adults through therapy, surgery or medication; teach people how to stay well; conduct research on diseases and new methods of prevention and treatment; and teach medical students and residents.

There are two types of physicians: the allopathic physician (better known as the MD or Medical Doctor) and the osteopathic physician (better known as the DO or Doctor of Osteopathy). Both MDs and DOs are physicians who may specialize, perform surgery and prescribe medication, yet they differ in their health care philosophy and attend separate medical schools. Most DOs are primary care physicians who focus special attention on the healthy function of the musculoskeletal system—the supportive structures of the body, such as bones, muscles, ligaments and nerves.

Salary ♦ Although the median income for all MDs was \$160,000 in 1995, earnings vary greatly depending on specialty, type of practice, geographic location, experience, number of hours worked and many other factors.

Education and Training ♦ To practice as a physician, one must earn a college degree followed by a four-year degree as a Doctor of Medicine (MD) or Doctor of Osteopathy (DO) from an accredited school and pass an examination for state licensure from the NC Board of Medical Examiners as well as a National Medical Licensure Examination. At least one year of post-medical school experience is required, but most graduates of medical and osteopathy school complete a longer period of specialty training called a residency. Residency training is required for persons entering any specialty, and can take from three to seven years or more. An in-depth examination is required at the end of the residency training in order to become certified by the board of examiners of the specialty. The general course requirements for entering medical school are: six hours of English; eight hours of biology (including vertebrate zoology); sixteen hours of chemistry (inorganic and organic) and eight hours of physics. Some medical schools also require college mathematics and calculus. Applicants must also take the MCAT, a national examination, no less than one year before applying to enter medical school.

HOTLinks ♦ Association of American Medical Colleges, www.aamc.org
♦ American Medical Association, www.ama-assn.org
♦ Princeton Review Online, www.review.com (search Medicine)

Primary Care Physicians

Primary care physicians are doctors who provide basic or general health care at a person's first contact with a health care system. Primary care physicians usually assume responsibility for health maintenance and therapy for illness, including consultation with specialists.

Family Practice Physician

A doctor who provides general family care.

General Internist

A doctor who specializes in the nonsurgical treatment of diseases. Physicians who specialize in internal medicine can subspecialize in many different areas, including cardiovascular disease, endocrinology, diabetes and metabolism, gastroenterology,

Medical Specialists

hematology, infectious disease, medical oncology, nephrology, pulmonary disease and rheumatology. Internists may also take examinations for certificates of added qualifications in adolescent medicine, clinical cardiac electrophysiology, critical care medicine, clinical and laboratory immunology, geriatric medicine, interventional cardiology and sports medicine.

Obstetrician and Gynecologist (OB/GYN)

A doctor who specializes in the area of childbirth and the female reproductive system, respectively.

Pediatrician

A doctor who focuses on the care of children from birth to 21 years of age—from immunizations to monitoring growth and development, from counseling on age-appropriate nutrition to guiding children and families through the potentially tumultuous phases of puberty and adolescence, prevention and health maintenance underscore every patient care interaction.



Medical Specialists

The American Board of Medical Specialties (www.abms.org/which.html) describes medical specialists as doctors who concentrate on certain body systems, specific age groups or on complex scientific techniques developed to diagnose or treat certain types of disorders. The training of a specialist begins after the doctor has received the M.D. degree from a medical school in what is called a residency. Resident physicians dedicate themselves for three to seven years to full-time experience in a hospital or ambulatory care setting, caring for patients under the supervision of experienced teaching specialists. Educational conferences and research experience are also part of that training.

A subspecialist is a doctor who has completed training in a general medical specialty and then takes additional training in a more specific subarea of that specialty called a subspecialty. This training increases the depth of knowledge of the specialist in that particular field. For example, cardiology is a subspecialty of internal medicine, pediatric surgery is a subspecialty of surgery, and child and adolescent psychiatry is a subspecialty of psychiatry. The training of a subspecialist within a specialty requires an additional one or more years of full-time education.

There are many different types of medical specialists. Here is a sample:

Anesthesiologist

A doctor who provides medical care to a patient throughout his or her surgical experience. This includes medically evaluating the patient before surgery, consulting with the surgical team, providing pain control and support of life functions during surgery, supervising care after surgery and medically discharging the patient from the recovery unit.

Cardiologist

A doctor who specializes in the treatment of heart disease.

Cardiac Electrophysiologist

A doctor who studies, prevents, manages and controls heart rhythm disorders.



What careers are hot right now?

Topping the list (according to the NC Employment Security Commission): dental hygienists, dental assistants, physical therapists, radiologic technologists, health information management professionals, speech language pathologists and audiologists and nuclear medicine technologists. Other professions which are booming as a result of medical breakthroughs include genetic counselors and engineers, clinical trials professionals and clinical pharmacologists.

Are there still health professionals who make house calls?

Some physicians today continue to make home visits; however, this is rare and is usually confined to rural or remote areas, or to patients for whom the physician has provided many years of care. With the emergence of in-home health care, however, patients who have been recently discharged from a hospital or nursing home, or who are homebound, are often visited by rehabilitation professionals such as nurses, physical therapists and occupational therapists.



Do I have to go to college to become a health professional?

There are at least three other avenues outside a university you can pursue to get the education and training needed to become a health professional. One option to consider is enrolling in a two-year community college or technical institute to earn an associate degree. For example, opportunities at this level exist for opticians, dental hygienists, emergency medical technicians, licensed practical nurses, respiratory therapists, veterinary technicians and more. Phlebotomists, nurse's aides, orthotists and prosthetists receive on-the-job training from specialized hospital-based programs. Perhaps one of the best options to consider is enlisting in the U.S. Military where health professionals are in great demand, particularly in the fields of nursing and the allied health professions. Check out Health Careers in the Armed Forces online at militarycareers.com.

Medical Specialists

Dermatologist

A doctor who diagnoses and treats diseases of the skin, hair, nails and mucous membranes. Dermatologists often perform surgery on the skin to prevent disease, control the spread of disease and improve the skin's appearance. As skin surgeons, they are trained in a variety of surgical procedures, including laser surgery, nail surgery, biopsy techniques and excisional surgery, including flaps and grafts.

Emergency Medicine Physician

A doctor who diagnoses and treats emergency illnesses.

Facial and Reconstructive Plastic Surgeon

A doctor who spends five to six years in postgraduate surgical training concentrating on the complex anatomy, physiology, pathology, biochemistry and bacteriology of all the organs and structures of the head and neck. Plastic and reconstructive surgeons are called upon to correct birth disfigurements such as birthmarks, cleft palates and congenital facial deformities; correct disfigurements resulting from accidents, burns and diseases; treat signs of premature aging; or change the size or shape of facial features.

Immunologist

A doctor who diagnoses and treats allergy and asthma related diseases.

Neurologist

A doctor who diagnoses and treats the brain and nervous system.

Nuclear Medicine Physician

A doctor who uses radioactive materials to diagnose and treat disease.

Ophthalmologist

A doctor who diagnoses and treats diseases and injuries of the eye. Ophthalmologists perform examinations of the internal and external structures of the eye, order laboratory tests, prescribe medications and treatments, evaluate vision and prescribe corrective lenses. Ophthalmologists also perform surgery on the eye.

Otolaryngologist

A doctor who diagnoses and treats diseases of the ears, nose and throat. The otolaryngologist is certified to perform surgery on the head and neck.

Pathologist

A doctor who receives four or more years of training after medical school in the use of laboratory tests to diagnose and treat disease. The pathologist is usually responsible for the administration of the pathology laboratory and also researches ways to improve disease detection, prevention, cure or treatment. Because of the pathologist's role in explaining and reporting laboratory test results, he or she is sometimes referred to as "the doctor's doctor."

Physical Medicine and Rehabilitation Physician

A doctor who specializes in the rehabilitation of people who have suffered from a stroke, heart attack or similar conditions.

Preventive Medicine Physician

Preventive medicine physicians promote health and prevent disease by working with individuals and communities. Preventive medicine physicians manage programs in public or community health and conduct research to prevent and control disease; use scientific methods to identify health and safety hazards in the workplace and work to prevent occupational illness and injury; work to improve preventive and

Physician Assistant • Optometry

primary care services to underserved and high risk populations; and work to assess and eliminate environmental health hazards. Preventive medicine physicians are knowledgeable and competent in the areas of biostatistics; epidemiology; environmental and occupational health; planning, administration and evaluation of health services; the social and behavioral aspects of health and disease; and the practice of prevention in clinical medicine.

Psychiatrist

A doctor who specializes in the diagnosis, treatment and prevention of mental and emotional problems.

Radiologist

A doctor who specializes in the use of X-rays, radioactive materials and other imaging procedures to diagnose diseases.

Urologist

A doctor who specializes in male reproductive and unisex urinary tract health.

Physician Assistant

Physician assistants (PAs) are licensed to provide health services with the supervision of a physician. They conduct physical exams, diagnose and treat illness, order and interpret tests, advise patients on preventive health care, assist in surgery and can write prescriptions in 45 states. Over 50 percent of all PAs practice primary care medicine in the areas of family medicine, internal medicine, pediatrics and obstetrics and gynecology. About 19 percent are in surgery or the surgical subspecialties.

Salary ♦ For 1998, the American Academy of Physicians Assistants lists the average earnings for all PAs at \$64,269. PA graduates entering the field in 1997 earned an average of \$54,776.

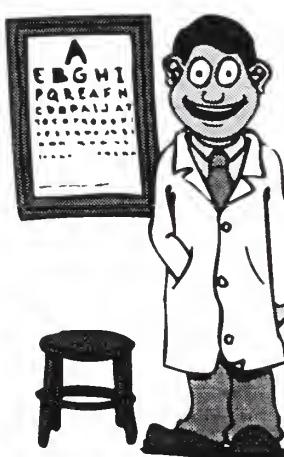
Education and Training ♦ To become licensed as a physician assistant, an applicant must complete an intensive education program approved by the Commission on Accreditation of Allied Health Education Programs. Two-year programs generally follow two or three years of undergraduate preparation or a bachelor's degree. Four-year programs are combined with a baccalaureate degree program. Programs cover science as well as supervised practice. A certification exam is required.

HOTLink ♦ American Academy of Physician Assistants,
www.aapa.org

Optometry

Optometrist

The **optometrist** (Doctor of Optometry or OD) is the only health care provider thoroughly trained in all aspects of vision science and optics. The optometrist is an independent primary health care provider who examines, diagnoses, treats and manages diseases and disorders of the visual system, the eye and associated structures. The optometrist prescribes glasses and contact lenses, offers rehabilitation of the visually



How long does it take to become a doctor?

There's more than one way to become a "doctor." There are medical doctors, doctors of osteopathy, optometry, veterinary medicine and chiropractic medicine to name a few. These doctors first earn a baccalaureate degree (usually four years) followed by four years of education and training in a health professions school. Most will then complete an additional one to seven years or more of specialized training called a residency. The length of residency depends on the specialty. For example, a family physician may complete residency training in three years and begin to practice, while a surgeon's training may require up to seven or more years to complete. On the other hand, residency training isn't required for Doctors of Veterinary Medicine, Chiropractic Medicine or Optometry.

How long does it take to complete...

Average length for full-time students (cumulative years):

Associate Degree (Community College)	2 yrs.
Baccalaureate Degree (College/University)	4 yrs.
Master's Degree (College/University)	6 yrs.
Doctorate Degree (College/University)	8 yrs.
Medical Residency Training 8 + 3-7 or more yrs.	

I'm a freshman in high school and I want to go to college in North Carolina. How can I be sure I'm taking the right courses to get in?

To gain admittance to any of the UNC system schools, you must have completed at least four courses in **ENGLISH** (English I, II, III and IV); three courses in **MATHEMATICS** (Algebra I, II and Geometry or course with Algebra II prerequisite); two courses in **SOCIAL STUDIES** (U.S. History and an elective); three courses—one must be a lab course—in **SCIENCE** (Life Science, biology for example, Physical Science, physics or chemistry, for example, and an elective); two courses in a **FOREIGN LANGUAGE I AND II** (foreign languages are recommended, but not required at all schools); and **ELECTIVES**. There are still plenty of openings for electives, since it takes 20 course units to graduate, and most campuses in the UNC system require only 12. If you're seriously considering a health career, try taking advanced-level math and science courses as part of the remaining 8 course units. It's also a good idea to have a math or science course and foreign language in your senior year so the material will be fresh in mind during your freshman year in college.



Dentistry

impaired and diagnoses and treats ocular disease. The optometrist can specialize in the prescription of contact lenses, environmental eyecare, vision rehabilitation, pediatrics and sports vision. (Also see *ophthalmologist* under "Medical Specialists.")

Salary ♦ According to a recent salary survey by the Review of Optometry, the average net income of an optometrist is \$105,918. Optometrists who specialize, have a private practice or work in a higher income area, however, can experience increased earnings.

Education and Training ♦ To practice as an optometrist, one must earn a college degree followed by four years of optometry school. Coursework towards a BS degree should include a year each of biology, zoology, chemistry, physics, English and mathematics. Applicants must take the Optometry Admission Test before applying to optometry school.

HOTLink ♦ American Academy of Optometry, www.aoa.org



Optician

Opticians design, measure, fit and adapt lenses and frames for clients according to written optical prescription specification. Opticians repair eyewear and replace lost or damaged lenses or parts, as well as assume the daily tasks of maintaining patient records, maintaining stock and office supplies and handling payments.

Salary ♦ Average starting salary: \$20,000

Education and Training ♦ Most opticians in North Carolina are trained in two-year technical associate degree programs at a community college, followed by a six-month internship with a licensed North Carolina optician, optometrist or ophthalmologist. Graduates of the programs accredited by the Commission on Opticianry Accreditation are eligible for a national certification examination and for state licensure, after passing the NC Opticians Examination. State licensure is also available to high school graduates who complete a three and a half year apprenticeship under a licensed optician and pass the state examination.

HOTLink ♦ National Academy of Opticianry, www.nao.org

Dentistry

Dentist



Dentists (DDS/Doctor of Dental Surgery, or DMD/Doctor of Dental Medicine) detect, diagnose and treat problems affecting the teeth, gums, tongue, lips and jaws. Dentists fill cavities, treat gum diseases, replace missing teeth or make custom dentures for the patient. They also teach patients proper oral care to prevent gum disease and tooth loss.

Salary ♦ In 1997, the Bureau of Labor Statistics reported that 41 percent of dentists earned \$125,000 and above each year. The American Dental Association reports that specialists earn nearly \$192,000 yearly.

Education and Training ♦ To practice as a dentist, students must complete a minimum of three years (96 semester hours) of accredited college work, followed by four years of dental school (the Dental Admissions Test is required for admission). Students must also pass State and National Board exams for full licensing. Specialization may require two to four additional years of study and additional exams.

HOTLink ♦ American Dental Association, www.ada.org
♦ American Association of Dental Schools, www.aads.jhu.edu

Dental Specialties

Although the majority of dentists choose to be general practitioners, eight dental specialty areas exist.

- endodontics (root canal therapy)
- oral and maxillofacial surgery
- oral and maxillofacial pathology
- orthodontics and dental orthopedics (braces)
- pediatric dentistry
- periodontics (gum disease)
- prosthodontics (dentures/partials)
- public health dentistry

Dental Hygienist

Clinical dental hygienists perform oral health assessments, provide nutritional counseling and self-care programs to prevent disease, examine head, neck and oral regions for disease, take and process X-rays and perform other diagnostic tests and provide services that help patients prevent gum diseases and cavities. For example, dental hygienists remove plaque and stains, apply sealants and fluoride to prevent decay, perform oral cancer and blood pressure screenings, provide oral health instructions, place and remove temporary fillings and periodontal dressings and remove sutures.

Salary ♦ The American Dental Hygienists' Association lists the average hourly wage earned by full-time clinical dental hygienists at \$18.00. Part-time clinical dental hygienists earn an average of \$22.00 per hour.

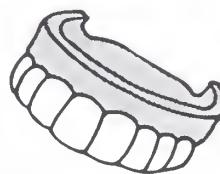
Education and Training ♦ Training is available from a community college (two-year) program and from a university three or four-year program. All programs cover anatomy, oral care, X-rays and related topics. State licensure is required.

HOTLink ♦ American Dental Hygienists' Association,
[www.adha.org/
careerinfo/index.html](http://www.adha.org/careerinfo/index.html)

Dental Laboratory Technologist

Dental laboratory technologists create and repair complete or partial dentures for people who have dental problems, need orthodontic work or want cosmetic corrections. They also design fixed prostheses (crowns, inlays and bridges) and design appliances used in orthodontics, oral and jaw surgery. Dental laboratory technologists work with a wide variety of dental materials including ceramics, precious metal, acrylics and gypsum. A thorough knowledge of dental anatomy and oral structures is essential as they examine impressions and models of the teeth and use this information to make the dental restoration or appliance as prescribed by a dentist.

Salary ♦ The average annual wage for all workers in dental laboratories is \$23,723 a year, according to the most recent figures from the Bureau of Labor Statistics (1995). Some trainees in dental labs earn minimum wage, while experienced technicians with



What is meant by a "gatekeeping" course?

Gatekeeping courses are entry level courses that act as a springboard to many other avenues in high school education. If you don't pass a gatekeeping course, you cannot move on to more advanced courses. For example, Algebra I is the most important gatekeeping course. You must pass Algebra I before you can take any advanced math or science course. And high school math and science courses are fundamental requirements for college health science curriculums.

Online Study Help

[www.mtsu.edu/~studskl/
#anchor344276](http://www.mtsu.edu/~studskl/#anchor344276)

Originating out of the Department of Developmental Studies at Middle Tennessee State University, the **Study Skills Help Page** offers numerous strategies for success for high school students. The site offers a study skills buffet bonanza: tips on getting the most from taking notes and reading your textbook, test-taking strategies, memory principles, time management skills and more. The site also provides high school students with a comprehensive list of links to other study strategies, including Dr. Freedman's Math Help and Critical Thinking Resources. Bookmark worthy!

How do the PSAT and SAT differ?

The PSAT, or the Preliminary Scholastic Assessment Test, is a practice version of the SAT. Schools do not use the PSAT for admission purposes, as they do with the SAT. Some schools do, however, look at the highest PSAT scores and may even invite high scorers to visit their campuses. The SAT is used by most schools to decide whether to admit a student. This test is divided into the SAT I and the SAT II. The SAT I contains a verbal and a math section, while the SAT II is a series of achievement tests in different subject areas. At UNC-Chapel Hill, the SAT I is used for admission along with the SAT II math test. Different schools have different requirements along these lines, so it's best to consult the College Board to determine what your school of choice requires. The College Board also provides information on the American College Admission Test (ACT). Contact the College Board instantly via <http://www.CollegeBoard.org>.

When should I take the PSAT or SAT?

The advantage in taking the PSAT is to learn strategic test-taking skills. In taking the test, you can become aware of weaknesses early enough to correct them. It's good to take the PSAT as a sophomore to give you time to correct those weaknesses. Students usually take the SAT in the junior year, while most college-bound seniors take it by the fall of their senior year.

Veterinary Medicine

talent can earn \$40,000 to \$60,000 a year.

Education and Training ♦ Training is usually two-years at a community college or technical institute. Courses include dental anatomy, dental materials, chemistry, physics, math, economics, ceramics, complete and partial dentures and instruction on creating crown and bridgework. National exams are required for certification.

HOTLink ♦ National Association of Dental Laboratories, www.nadl.org



Veterinary Medicine

Veterinarian

Veterinarians are doctors who treat and prevent the illnesses of pets, livestock, marine animals and wildlife. They identify and treat medical problems and injuries, set broken bones, perform surgery, prescribe medicines and administer vaccinations. Veterinarians also work to control the spread of disease in animals and its transmission from animals to humans; research treatments for illness in both animals and humans; oversee food production to ensure its safety; and play a leading role in government public health efforts. Practice areas include avian, beef cattle, canine and feline, dairy, equine, farm, feline only, food animal, swine health and zoo management. Veterinary specialists deal with specific animal medical problems. These vets may specialize in ophthalmology (vision), dermatology (skin), radiology (X-rays) and pathology (diseases).

Salary ♦ The average starting salary for all vets is \$34,000, according to the American Veterinary Medical Association. Vet salaries do increase over time. The average for all working veterinarians in private practice is \$57,500 a year, while those working in government or industry earn about \$67,000.

Education and Training ♦ The minimum requirement of most veterinary colleges is two years of pre-veterinary study at a university, but your chances of admission are better if you start with a bachelor's degree. To practice as a veterinarian, students must then complete an additional four years of veterinary school and pass a national licensure examination. Students wishing to become a veterinary specialist will need another three years of education in the form of a residency program.

HOTLinks ♦ American Board of Veterinary Practitioners, www.abvp.com
♦ American Veterinary Medical Association, www.avma.org
♦ Association of American Veterinary Medical Colleges, www.aavmc.org/prevet.htm
www.futurescan.com/vet/index.html (I want to become a veterinarian)

Veterinary Technician

Veterinary Technicians primarily function as professional technical support to veterinarians, biomedical researchers and other scientists. Their responsibilities include taking X-rays, performing laboratory tests, obtaining and recording information about cases and preparing animals, instruments, equipment and medication for examination and surgery. Technicians may also manage an office and coordinate hospital care. Veterinary technicians in research may also supervise the operation of research colonies and facilities, as well as assist in the design and implementation of research projects.

Osteopathic Medicine

Salary ♦ The average starting salary for animal hospital technicians is \$16,000 per year. Technicians who work in research laboratories can expect to start at \$19,000.

Education and Training ♦ Veterinary technicians must complete a two-year associate degree program at a community college or technical institute to receive the Associate of Applied Science Degree in Veterinary Technology. General coursework includes math, chemistry, medical terminology, technical writing, humanities and clinical office management. Science courses include veterinary science, anatomy and physiology, microbiology and disease process, pharmacology, hematatology, parasitology, clinical chemistry and urinalysis and anesthesiology. Other courses may include large animal medicine, avian science, lab animal medicine, surgery, laboratory and treatment procedures, radiology and emergency room procedures. National and state examinations are required for licensure.

HOTLinks ♦ Association of Zoo Veterinary Technicians, www.worldzoo.org/azvt
♦ Academy of Veterinary Emergency Critical Care Technicians,
<http://veccs.org/avecct/default.htm>
♦ North American Veterinary Technicians Association,
www.avma.org/navta/default.htm

Osteopathic Medicine

Osteopathic Physician

The **Doctor of Osteopathy** (DO) is trained to view the human body as a single organism. Because the DO considers all body systems as interrelated and dependent upon one another for good health, he or she treats specific illnesses in the context of the whole person. In addition to using all forms of medical treatment, the DO uses osteopathic manipulative techniques (OMT) to diagnose and treat patients. OMT is a set of manual medicine techniques that may be used to relieve pain, restore range of motion, and enhance the body's capacity to heal. Reflecting their interest in treating the whole patient, many DOs choose to become family practitioners. (See also *physician*.)



Salary ♦ See *physician*.

Education and Training ♦ See *physician*.

HOTLinks ♦ American Association of Colleges of Osteopathic Medicine,
www.aacom.org
♦ American Osteopathic Association, www.am-osteо-assn.org
♦ National Osteopathic Foundation, www.osteopathic.org

Pharmacy

Pharmacist

Registered pharmacists prepare and dispense medications prescribed by doctors, dentists or other authorized medical practitioners. Pharmacists must know what's in a drug, how it works and how it affects people with different illnesses or injuries. They monitor patient



CAREERPrep

How should I prepare for the PSAT and SAT?

Take the hardest courses you can. There are various preparation courses out there, but they primarily address the strategies used to take the test and practicing for the test itself. The PSAT will serve that purpose if you take it before the SAT. If you take the most advanced courses, you will have covered the content on both these tests and you should have no problem performing well on them. The bottom line is, prepare well in advance and don't rely on prep courses and materials to pull you through.

Why should I take advanced placement courses?

Advanced placement courses are designed to challenge you. When you enroll in an advanced placement course, you become better prepared for college and beyond. College admissions counselors understand that advanced placement courses are more difficult than regular courses. They also understand how much advanced placement courses contribute to your knowledge, skills and abilities which, in the long run, are more important than grades. Finally, admissions counselors realize that lower grades in advanced courses aren't comparable to the same grades in other courses.

What's the best way to find a mentor?

STEP 1: Find someone you can identify with. Michael Jordan has probably never seen the inside of an operating room, so if you want to become a surgeon, find a physician whose day-to-day activities involve surgery rather than choosing a professional athlete who can only cut it (ouch!) on the court or playing field.

STEP 2: Look for a mentor who has overcome or succeeded in a situation similar to the one you are facing. Choosing someone like you who has accomplished a goal that you want to accomplish will make it easier to apply that success to your own life. Once you've found the right mentor, make use of this person's courage, persistence and strengths by following these tips:

- **Find out as much about the person as you can.** Where did he grow up? What was her position in the family (youngest, middle, oldest)? Where did she go to school, college or professional school? What was her educational experience like? What activities did he participate in? What was her source of motivation? What obstacles did he have to overcome? How did she manage her time? How did he pay for school?

- **Respect your mentor's time.** Exercise patience, flexibility, respect and courtesy at all times. If you wish to visit your mentor, make an appointment. Unannounced visits and on-the-spot demands are sure to ruin a budding relationship.

Podiatry

medications to avoid complications caused by drug interactions and educate patients, doctors and other health professionals on proper doses and possible side effects. Pharmacists also purchase medical supplies, advise patients on medical equipment and over-the-counter products, and supervise staff and manage a small business if they have their own pharmacy. There is a demand for pharmacists in research at large pharmaceutical companies. In this area, pharmacists might specialize in research or sales, so often a master of business administration (MBA) accompanies those heading into the corporate side of drug development.

Salary ♦ Registered pharmacists earn on average \$52,000 a year.

Education and Training ♦ Currently, the bachelor of science degree in pharmacy takes a minimum of five years—one year of first-year university sciences followed by four years in pharmacy. Those interested in retail work take a one-month internship, while those aiming for hospital work need a longer residency. The bachelor degree program in pharmacy is, however, being phased out as a professional degree. Beginning in 2005, schools with programs accredited by the American Council on Pharmaceutical Education will instead offer the doctor of pharmacy (PharmD) degree which takes six years to complete. State licensure is required.

HOTLinks ♦ American Association of Colleges of Osteopathic Pharmacy, www.aacp.org
♦ American Association of Pharmaceutical Scientists, www.aaps.org
♦ American Pharmaceutical Association, www.aphanet.org

Podiatry

Podiatrist

Doctors of Podiatric Medicine (DPMs), commonly called podiatrists, diagnose and treat common foot problems such as corns, calluses, ingrown toenails and bunions and more serious problems such as lower-leg disorders, diseases and injuries. Podiatrists prescribe and fit corrective braces and shoes, perform surgery and advise patients on proper foot care. Podiatrists can choose to specialize in four areas: orthopedics/biomechanics (treatment of imperfect foot structures), podiatric surgery, podopediatrics (children's foot problems), podogeriatrics (foot disorders of the elderly) and podiatric sports medicine.

Salary ♦ In 1997, the Bureau of Labor Statistics indicated that roughly 50 percent of podiatrists earned over \$90,000 a year. The American Podiatric Medical Association notes the highest net income—an average of \$141,135 a year—is earned from 16 to 30 years in practice.

Education and Training ♦ A minimum of 90 hours of undergraduate preparation is required to enter a professional program in podiatry, however most applicants have a college degree. Applicants must take the Medical College Admissions Test (MCAT). The education program in podiatric medicine takes four years, including clinical training, followed by a one to three-year postdoctoral training period at a teaching hospital. Podiatrists choosing to specialize spend more time in residency training or pursue fellowship training.

HOTLinks ♦ American Association of Colleges of Podiatric Medicine, www.aacpm.org
♦ American Podiatric Medical Association, www.apma.org



Public Health

When you hear the words "public health," think community. Public health professionals are concerned with community-wide health care and deal with specific populations rather than individuals. Public health professionals protect our food and water supplies; control the spread of diseases such as AIDS and Hepatitis C; identify, eliminate or control potential workplace hazards; and provide state and government officials with essential information on health threats. Although there are many public health specialties, most career opportunities are found in the following ten fields:

- biomedical and laboratory practice
- biostatistics
- environmental health science
- epidemiology
- health education
- health services administration
- international public health
- nutrition
- occupational safety and health
- public health practice and program mgmt.

Health professionals from other fields may also choose to specialize in one of these public health specialities.

Biomedical and Laboratory Practice

Public health professionals in this field include laboratory specialists and research scientists who investigate health and disease using lab technology. They may specialize in the following areas:

- biochemistry
- biomedical laboratory science
- biology sanitation
- chemistry sanitation
- genetics
- immunology
- laboratory practice
- microbiology
- molecular biology
- pathobiology/pathology
- parasitology
- pharmacology
- physics
- physiology
- toxicology
- virology

Salary ♦ Salaries for laboratory specialists and research scientists vary greatly according to degree, specialization, geographic location and employer. In 1996, the Association of Schools of Public Health listed the average salary for all workers in the field of biomedical and laboratory practice at \$54,000.



Education and Training ♦ The minimum educational requirement is a bachelor's degree in one of the physical, mathematical or health sciences. However, a master's or doctorate degree is required to conduct advanced research and to be eligible for many jobs at university and industrial research laboratories.

HOTLinks ♦ National Academy of Sciences, National Research Council, www.nas.edu
♦ American Association for the Advancement of Science, www.aaas.org

Biostatistics

Biostatisticians are experts who work with data from medical research to help solve problems regarding human health. They analyze health data to help plan health care services. They also aid in research to develop new treatments and new preventive techniques for diseases. Biostatisticians apply their knowledge to environmental issues, health service costs, patterns of disease and other areas.

CAREERPrep

What's the best way to learn about a health profession?

There are several ways to learn about health careers. **First**, read all that you can about your area of interest. Identify books, newsletters, magazines and other periodicals focused on the profession. Read historic accounts of leaders in your profession. Learn about technological advancements and scientific breakthroughs, trends and global issues affecting the profession. Research Internet sites specifically related to your field of study. **Second**, find someone working in the field and start asking questions (Remember, the more you ask, the more you learn!): How long have you worked in this occupation? What do you like most and least about your career? Do you work primarily with people, data or things? Why did you choose this career? What personal qualities are needed to succeed in this career? What type of education and training is needed for this career? Where did you go to college or professional school? What was it like? How did you pay for college? Describe a typical work day. Describe your work environment. How is technology changing your profession? What obstacles did you face while pursuing your career and how did you overcome them? **Third**, gain plenty of community service experience. Read on...

Careers in Public Health

Why are community service activities so important?

If you're serious about becoming a health professional, then your career plan isn't complete without volunteer or clinical experience. Colleges will look for examples of high school community service and leadership activities on your application, and admissions committees will expect to see evidence of volunteer activity on your application to health professions or graduate school. Volunteer or clinical experiences demonstrate to admissions committees: 1) your commitment to a particular field of study, 2) your willingness to serve others and 3) your knowledge of the day-to-day operations of a practitioner. For example, if veterinary medicine is your passion, assisting in an animal hospital several times a week will give you a better understanding of what it's like to care for a variety of sick or injured animals. The *duration* of community service is equally important. Many students try to cram community service activities into their senior year in high school believing that admissions committees will look favorably on the activity. Such 'quick stints' of service can prove more harm than good; they demonstrate to the admissions committee that you're not serious about your career pursuit, and that can definitely hinder your ability to gain admission.

Salary ♦ In 1996, the Association of Schools of Public Health listed the average salary for all biostatisticians at \$45,000. Starting salaries for biostatisticians vary by degree: Bachelor's Degree: \$28,000 to \$33,000; Master's Degree: \$35,000 to \$40,000; Doctorate: \$45,000 to \$55,000.

Education and Training ♦ Biostatisticians earn a minimum baccalaureate degree, and need a master's or doctoral degree for more advanced research positions. Studies cover statistical methods, data management, demographics and other related areas.

HOTLinks ♦ American Statistical Association, www.amstat.org
♦ American Public Health Association, www.apha.org

Environmental Health Science

Environmental Health Scientists identify and try to prevent or eliminate environmental health hazards such as chemicals, fumes, dust, human and industrial wastes, radioactive materials and germs. Some environmental health scientists conduct research; others work as inspectors for public agencies and industry. Environmental health scientists may specialize in food protection, radiological health, environmental health, environmental medicine, sanitation, water quality and resources, air pollution and resources, noise pollution, toxicology and solid waste management. Careers in environmental health science include health inspector, industrial hygienist, environmental lawyer, engineer, scientist, technician, health physicist and more.



Salary ♦ Salaries for environmental health scientists vary greatly according to degree, specialization and geographic location. In 1996, the Association of Schools of Public Health listed the average salary for all workers in the field of environmental health science at \$95,000.

Education and Training ♦ Environmental health scientists have a bachelor's degree in environmental health or related field, and complete a supervised training and internship period which varies in length according to specific discipline. Environmental health scientists involved in research, administration, environmental protection and resource management earn at least a master's degree, while some earn doctoral degrees in areas such as water resources engineering, air and industrial hygiene, environmental management and related fields. To enter a graduate program in environmental health science, applicants should have a bachelor's degree or substantial coursework in science and engineering.

HOTLinks ♦ American Public Health Association, www.apha.org
♦ Environmental Career Organization, www.eco.org

Epidemiology



Epidemiologists are scientists who study patterns of disease in populations and develop ways to prevent or control disease. They provide the scientific data necessary to help governments, health agencies, health care providers and communities deal with epidemics and health issues such as cancer, cardiovascular disease, AIDS, diabetes and veterinary medicine. Their primary concern is the health of the community as opposed to the health of the individual.

Careers in Public Health

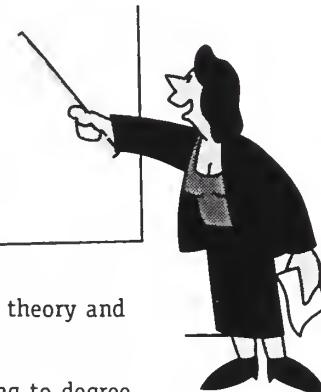
Salary ♦ In 1996, the Association of Schools of Public Health listed the average salary for epidemiologist graduates at \$90,000.

Education and Training ♦ Epidemiologists require university training in epidemiology or a public health related field. Usually a bachelor's degree in the health sciences, mathematics, biological science or behavioral science is followed by specialized training at the master's and doctorate level. The most common degrees offered are the master's of public health (MPH), the master's of science (MS), the doctor of philosophy (PhD) and the doctor of public health (DrPH).

HOTLinks ♦ Association for Professionals in Infection Control and Epidemiology, www.apic.org
♦ Centers for Disease Control and Prevention, www.cdc.gov
♦ Epidemiology Section, American Public Health Association, www.apha.org
♦ National Association of Public Health Statistics, www.naphsis.org
♦ Society of Epidemiological Research, www.jhsph.edu/Publications/JEPI/ser.htm

Health Education

Health Educators inform people, groups and communities about the causes and prevention of health problems, especially those that relate to lifestyle, work and cultural factors. Health educators help others improve their health by providing counseling, planning programs and organizing community efforts. Health educators may specialize in the behavioral sciences, public health education, school health education, communication theory and health media.



Salary ♦ Salaries for health educators vary greatly according to degree, specialization and employer. In 1996, the Association of Schools of Public Health listed the average salary for health education graduates at \$58,000.

Education and Training ♦ Health educators must earn a baccalaureate or master's degree in health education. Studies cover public health research, theory and practice, social policy, health issues in different populations, community diagnosis, planning, management and evaluation techniques.

HOTLinks ♦ American Association for Health Education, www.aahperd.org
♦ American Public Health Association, www.apha.org
♦ Society for Public Health Education, www.sophe.org

Health Services Administration

Health Services Administrators in public health deal with the organization, policy formation, financing and economics involved in a community-wide health care system. They may specialize in the following areas:

- health services administration
- operations research and systems
- health planning
- health policy
- hospital administration
- health economics
- health administration
- health law
- general public health
- general public health



CAREERPrep

What should I look for in a volunteer experience?

Community service activities should meet your individual needs and help fulfill career goals. To gauge the value of an activity, ask yourself several questions: *What will I learn from the experience and how best can I use this knowledge in my career? If I work in a healthcare setting, will I be permitted to shadow the practitioner? Will I have an opportunity to observe a variety of medical procedures? Will I be able to assist in any of these procedures? How much people contact will I have and in what capacity (answering phones in a reception area or taking patient histories, for example)? Am I volunteering for the right reasons, or do I just want something to put on paper?* How you answer these questions will help you decide if the experience is right for you.

How can I best find a service activity?

Make your aspirations known! Talk with your personal healthcare providers (doctor, dentist, optometrist, etc.) and ask about volunteer opportunities in their offices. If none are available, ask for referrals. Talk with teachers, relatives, church members and others you know who work in the area you're interested in. Research summer and academic year science enrichment programs to determine if volunteerism or clinical experience is a program component. Call a practitioner whose name appears in the telephone yellow pages. Investigate *all* opportunities!

Put your talents and skills to use in the community. Get involved through:

1. Church related community outreach activities such as:
 - hospital and shut-in visits
 - crisis ministry outreach
 - food bank and homeless ministries

2. United Way member agencies such as:
 - Adolescent Pregnancy Services
 - American Red Cross
 - AIDS Service Agencies
 - Child and Parent Support Services
 - Direct Medical Services
 - Drug and Alcohol Recovery Support
 - Family Counseling Services
 - Hospice
 - Meals on Wheels
 - Rape Crisis Intervention
 - Senior Citizen Support Services
 - Suicide Intervention Services
 - Volunteers for Youth

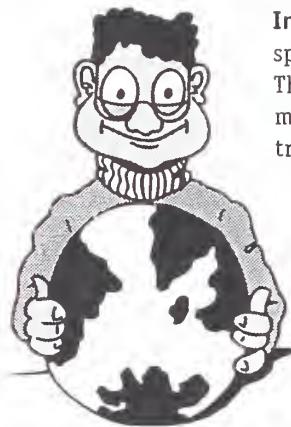
3. Habitat for Humanity
4. Local rescue missions and soup kitchens
5. Big Brothers, Big Sisters, YMCA, YWCA, Boy Scouts, Girl Scouts and other youth mentoring programs
6. Nursing homes and retirement villages
7. Animal life preservations
8. Sierra Club
9. Volunteers of America (703) 548-2288
10. Youth Service America (202) 296-2992

Salary ♦ Salaries for health services administrators vary greatly according to degree, specialization and employer. In 1996, the Association of Schools of Public Health listed the average salary for all health services administrators at \$107,000.

Education and Training ♦ Applicants to graduate programs in health services administration should possess a strong undergraduate background which includes coursework in microeconomics, college-level math and financial accounting. Graduates who earn the master of healthcare administration (MHA) degree take positions in staff or line management or as consultants in hospitals, health maintenance organizations, clinics, public health departments, and other healthcare settings.

HOTLinks ♦ American College of Healthcare Executives, www.ache.org
♦ Association of University Programs in Health Administration, www.aupha.org
♦ North Carolina Hospital Association, www.ncha.org

International Health



at \$58,000.

International Health Specialists apply all public health specializations to improving standards in developing countries. This includes ensuring that basic health and nutritional needs are met; identifying any endemic diseases and their modes of transmission; working towards community-wide sanitation and environmental safety; and educating the country's citizens on the importance of health maintenance. Most international health specialists are already health professionals, health administrators or policy analysts who intend to devote a significant part of their careers to improving health in developing countries.

Salary ♦ In 1996, the Association of Schools of Public Health listed the average salary for international health specialists

Education and Training ♦ Applicants to international health programs must possess a strong academic undergraduate background in public health education or other health-related discipline. The study of planning, managing and evaluating health care systems is an integral part of international health graduate programs which lead to the master's degree in public health (MPH). At least one semester is devoted to international training.

HOTLinks ♦ American Public Health Association, www.apha.org/resources/international.html
♦ World Health Organization, www.who.org

Nutrition

Nutritionists focus on the promotion of health and the prevention of disease among groups and communities through good food habits. Heart disease, diabetes, hypertension, infant low birth weight and other problems are linked to diet, and nutritionists conduct research and develop educational programs to help individuals, groups and entire communities reduce their health risks through nutrition programs. Nutritionists fight malnutrition in the United States and in other



Careers in Public Health

countries. Most nutritionists are also registered dieticians (RDs), although they are not required to be registered by the American Dietetic Association. Nutritionists can specialize in nutrition and food science, biochemistry, public health nutrition and maternal and child health.

Salary ♦ In 1996, the Association of Schools of Public Health listed the average salary for nutritionists at \$48,000.

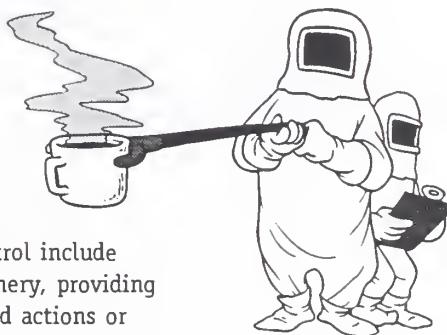
Education and Training ♦ Nutritionists who earn a bachelor of science in public health are prepared for at least two alternative career goals: 1) entry-level positions in community nutrition and dietetics; and 2) pre-professional study for careers in medicine, dentistry, and other health fields. Most nutritionists, however, choose to earn a master's degree in order to take advantage of higher-level and higher-paying positions in hospitals, food service management, research and nutrition consulting.

HOTLink ♦ American Dietetics Association, www.eatright.org

Occupational Safety and Health

Occupational Safety and Health

Specialists respond to the needs of employees and the public, analyze hazardous situations and research government regulations to determine which problems pose significant risk. Strategies for hazard control include designing or redesigning equipment and machinery, providing physical safeguards and training people to avoid actions or activities that may lead to injury. Specialists may focus on occupational health, occupational medicine, industrial hygiene and safety, or ergonomics, which is the applied science of equipment design intended to reduce operator fatigue and discomfort.



Salary ♦ In 1996, the Association of Schools of Public Health listed the average salary for occupational safety and health specialists at \$84,000.

Education and Training ♦ At the undergraduate level, students usually seek a degree in science or engineering, and must possess a strong high school college preparatory background which includes courses in mathematics (especially algebra, calculus and trigonometry), biology, organic and inorganic chemistry and physics. Although a minimum bachelor of science degree is required, a master's degree increases the likelihood of securing a job.

HOTLinks ♦ American Society of Safety Engineers, www.asse.org
♦ Occupational Safety and Health Administration (OSHA), www.osha.gov
♦ National Institute for Occupational Safety and Health, www.cdc.gov/niosh/homepage.html

Public Health Practice and Management

Public Health Program Specialists plan, implement and evaluate interventions to identify those at risk from a specified health problem, and try to prevent such health problems. Specialists work in public health practice, mental health, public health/community dentistry, public health nursing, preventive medicine, aging/gerontology, and



CAREERPrep

I'll have to work my way through college and won't have time to volunteer. Will this hurt my chances of getting into professional school?

Admissions committees realize that many students must work their way through college. This is taken into account. However, you must be able to demonstrate your desire and commitment to a particular field of study and have substantial knowledge of what the profession entails. If you work and have difficulty trying to fit community service into your schedule, be creative: look for summer programs, make an internship a part of one of your classes or design an independent study class where exposure to a health profession is a main component. If you must work, try to choose a position in a health care setting or human services area.

How much experience outside the classroom should I have in preparation for health professional school?

Don't get caught up in the numbers. If you want to help people, start in high school. A word of caution: Don't sacrifice your studies for community service. Making competitive grades (B+ average or better) should be your first priority. However, the student who can successfully balance academics with a history of community involvement is a viable health professional school candidate indeed.

What is meant by the term, 'health care personality type'?

To help you decide the health career best suited for you, carefully examine your interests, skills, talents and the types of job settings and scientific disciplines that interest you—all these factors go into creating your health care personality type. For example, if you desire to work with **data and information** and prefer little to no direct patient contact, consider a career in biostatistics, epidemiology, environmental health or health information management. If you want to work with **laboratory equipment and specimens**, careers in cytotechnology, pathology and clinical laboratory science may be just what you're looking for. If science, per say, is not your strong point, but you excel in the **arts** (writing, drawing, sculpting, photography, computer graphics), then careers in health communications, orthotics and prosthetics or laboratory technology might appeal to you. Finally, if you want **direct patient contact**, there's a full range of opportunity: physician assistant, family physician, nurse midwife, nurse practitioner, occupational therapist, physical therapist, speech-language pathologist, chiropractor, optometrist, etc. You get the idea. You'll spend years developing and enhancing your career so be sure to choose a profession that you will not only enjoy, but one that best suits your unique personality.

Allied Health

maternal and child health. Public health professionals often work for state or federal public health departments. A large number of public health professionals work for federal agencies such as the National Institutes of Health, Centers for Disease Control, Department of Health and Human Services, and the U.S. Military.

Salary ♦ In 1996, the Association of Schools of Public Health listed the average salary for all public health professionals at \$68,000.

Education and Training ♦ A minimum bachelor degree in public health is required; however, most advanced positions require master and/or doctoral-level training. Graduate students must take core courses in biostatistics, epidemiology, health administration, environmental health and behavioral sciences before narrowing their focus to a specialty.

HOTLinks ♦ American Public Health Association, www.apha.org
♦ Centers for Disease Control and Prevention, www.cdc.gov
♦ National Institutes of Health, www.nih.gov
♦ World Health Organization, www.who.org

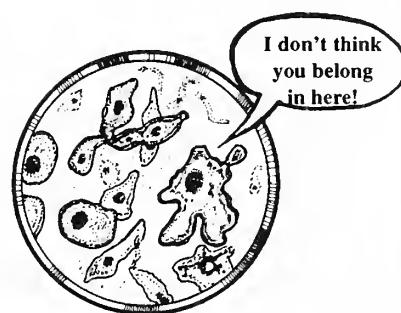
Allied Health

The term "allied health" is used to identify a group of diverse healthcare professionals who provide diagnostic, therapeutic and administrative services in every healthcare setting and facility. Allied health professionals comprise over 60 percent of the healthcare workforce. Although allied health encompasses more than 100 occupational titles, most allied health professionals work in the following areas:

- clinical laboratory science
- physical therapy
- genetic counseling
- radiation science
- occupational therapy
- speech and hearing science

Clinical Laboratory Science

Clinical laboratory professionals are highly trained individuals whose services are invaluable to hospitals and other medical facilities. **Cytotechnologists, histologic technicians and histotechnologists, clinical laboratory scientists, medical laboratory technicians, phlebotomists and specialists in blood bank technology** comprise the core staff of any clinical laboratory and interact daily with health care providers and administrators. Laboratory personnel perform specialized tests on blood, other bodily fluids and tissue samples to detect disease, infection and chemical imbalances in patients.



HOTLink ♦ Association of Schools of Allied Health, www.asahp.org

Cytotechnologist

Cytotechnologists are specially trained medical technologists who study cells and cellular abnormalities. They prepare slides of cell samples for examination and use powerful microscopes to screen slides of human cells to detect cancer or other disease. Cytotechnologists must be able to recognize abnormalities in the color, size, shape, make-up and patterns of the cells. Attention to detail is critical.

Careers in Allied Health

Salary ♦ Cytotechnologists earn between \$30,000 and \$40,000 a year to start.

Education and Training ♦ Cytotechnologists must possess a strong background in college-level science, mathematics and computer science (much of the work involves statistics). Cytotechnology programs may be offered as part of a 4-year undergraduate college program, or as a 5th year of training after completing a baccalaureate degree. Cytotechnologists must pass national board examinations.

HOTLinks ♦ American Society for Clinical Laboratory Science, www.ascls.org
♦ American Society of Cytopathology, www.cytopathology.org
♦ Association of Schools of Allied Health, www.asahp.org

Clinical Laboratory Scientist

Clinical laboratory scientists, also known as medical laboratory technologists, perform laboratory tests necessary for the diagnosis and treatment of disease. Clinical laboratory scientists oversee many laboratory operations and supervise medical laboratory technicians and other personnel. They often work with pathologists (*see Medical Specialists, Medicine*), other physicians and scientists using computers, chemicals and microscopes and other instruments to examine and perform tests on bodily fluids. Clinical laboratory scientists may specialize in clinical chemistry, hematology, immunohematology, microbiology and urinalysis.



Salary ♦ According to the Bureau of Labor Statistics, salaried clinical laboratory scientists earn about \$550 a week. The top 10 percent can earn an average of \$850 per week, or about \$45,000 a year.

Education and Training ♦ Clinical laboratory scientists must complete two to four years of college and two years of clinical education leading to a baccalaureate degree. They must also pass three certification exams.

HOTLinks ♦ American Society for Clinical Laboratory Science, www.ascls.org
♦ Association of Schools of Allied Health, www.asahp.org

Genetic Counseling

Genetic counselors provide information and guidance to individuals and families with histories of birth defects or familial genetic disorders and to families who may be at risk for a variety of other reasons. Individuals and couples who may benefit from genetic counseling include those with a family history of miscarriages; women 34 years of age and older who are pregnant or who are planning a family; and persons or families affected with mental retardation, birth defects, cancer, conditions such as blindness, deafness, etc., or other conditions which could be inherited. Genetic counselors help identify families at risk, investigate the problem present in the family, assess inheritance patterns and their risk of reoccurrence, explain the problem to the family and provide information about available options.

Salary ♦ Genetic counselors with less than five years experience earn, on average, \$38,000 a year.

Education and Training ♦ A master's degree in genetic counseling is required. Accredited training and documentation of genetic counseling experience as well as successful completion of a comprehensive certification exam is also required.



CAREERPrep

How will I know if I'm making a good career choice?

Good question. You want a career that is fulfilling and challenging, one that allows you to grow personally and professionally and, yes, pays the bills! Examine your skills, talents and interests and then combine them with your personal values, and presto! You'll have a good idea whether your career choice is a good choice, or a not so good, I-need-to-think-about-this-some-more choice. For example, if spending time with family is a high priority, becoming an emergency room physician might not make you happy in the long run. Before you decide on a career, find out all you can about the occupation and then ask yourself these questions: Will this career provide me with enough money to meet my family's lifestyle? Will this career allow me to utilize my skills and talents? How long does it take to acquire the education and training necessary for this career? Am I willing to make the sacrifices necessary to complete my education? How will I pay for professional school? Will jobs be available in this field when I complete my education? What other opportunities are there in my area of interest? Will I work primarily with people, data or things? How much time will I be required to be at work? How can I advance in my field of interest?

How you answer these questions will help you decide if the career you've chosen is right for you.

How can I find a college that's right for me?

For most students considering a health career, advanced education beyond high school means attending a college or university away from home. There are many factors to consider when looking at schools, factors which can help or hinder your academic success and personal growth. Here are some steps to help you decide which college or training program is right for you:

- Write down your career and life goals, then determine the education and degree(s) required.
- During your junior year, identify and research 10 to 15 colleges that offer the education, training and degree(s) you'll need to succeed in your chosen field. Don't choose a school based on its party reputation or quality of athletic teams!
- From the information gathered, narrow your choices down to 5 or 10 colleges, then write for catalogs.
- Rank the schools based on your ability to obtain admission and the quality of the experiences that you will gain.
- Visit 3 to 5 schools during the summer before your senior year. Arrange a visit in advance so that you can visit classrooms, tour the campus and talk with students already enrolled.
- Apply to a minimum of three schools by January of your senior year.

(continued on page 29)

Careers in Allied Health

HOTLinks ♦ American Board of Genetic Counseling, www.faseb.org/genetics
♦ National Society of Genetic Counselors, www.nsgc.org

Occupational Science

Occupational therapists (OTs) work with people whose ability to function in society has been reduced by injury, sickness (physical or mental), or age. They aim to improve the quality of life of the client by using many techniques to help the client learn or re-learn to carry out the occupations of daily life such as eating, dressing, writing, cooking and going to work. OTs evaluate functional skills, train people to do things such as dress or drive in a new way, identify barriers to meaningful activities and help people adapt activities or use adapted equipment to achieve self-sufficiency.

Salary ♦ Occupational therapists earned an average of \$42,700 in 1997. Salaries vary depending on years of experience, state of employment and employer.

Education and Training ♦ A bachelor's or master's degree in occupational therapy is required to practice in this profession as a Registered Occupational Therapist (OTR). This program includes six to nine months of clinical training.

HOTLink ♦ American Occupational Therapy Association, www.aota.org

Physical Therapy



Physical therapists (PTs) offer services that help patients restore function, improve mobility, relieve pain and prevent or limit permanent physical disabilities of those suffering from injuries or disease. Their patients include accident victims and individuals with disabling conditions such as lower back pain, arthritis, heart disease, fractures, head injuries and cerebral palsy. PTs use a variety of methods to help their patients, including therapeutic exercise, massage, hydrotherapy and manipulations. PTs design treatment programs and assess the patient's physical abilities and progress. They maintain statistical and clinical records, confer with other healthcare professionals and often develop and implement health promotion programs.

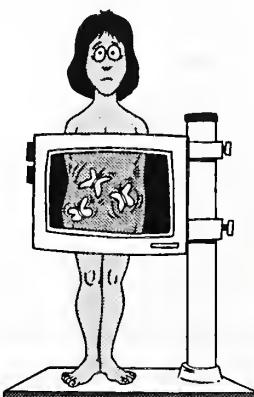
Salary ♦ Physical therapists earn an average of \$51,085 a year in North Carolina.

Education and Training ♦ Physical therapists must graduate from an accredited clinical master's or clinical doctoral degree program. A licensing exam is required.

HOTLink ♦ American Physical Therapy Association, www.apta.org

Radiation Science

Radiologic technologists (sometimes called radiation therapists, radiotherapy technologists, or nuclear medicine technicians) do everything from positioning patients and taking X-rays to applying radiation therapy to cancer patients, giving chemical mixtures to patients to highlight areas of the body for X-rays, operating ultrasound equipment and giving mammograms to women. Radiologic technologists learn the theory and practical aspects of the uses of imaging equipment



Chiropractic Medicine

to produce the clear and accurate images needed by physicians to study the organs and bones for injury and disease.

Salary ♦ Radiologic technologists earn between \$23,000 and \$35,000 per year depending on their training, experience and employer.

Education and Training ♦ Radiologic technologists can receive their education at community colleges, universities or in hospital-based programs which are often affiliated with colleges and universities. The program is usually two years. Students earning their bachelor's degree may go through a "2 + 2" program, meaning two years of preparatory college courses and two years of professional courses in principles of radiography.

HOTLinks ♦ American College of Radiology, www.acr.org
♦ American Registry of Radiologic Technologists, www.aart.org
♦ American Society of Radiologic Technologists, www.asrt.org

Speech and Hearing Science

Speech language pathologists are specialists in communication who evaluate and treat problems with speech, voice and language. They fine-tune speech patterns, help people who stutter or who have had strokes or traumatic head injuries, and work to cure swallowing disorders. They also treat clients who have autism, cerebral palsy, multiple sclerosis and mental retardation. Because the ability to hear often affects speech, speech-language pathologists often work closely with **audiologists**.



Audiologists diagnose, evaluate and treat hearing disorders. Some audiologists work only with children or newborns, but most work with senior citizens whose hearing becomes impaired with age.

Salary ♦ According to a survey conducted by the American Speech-Language-Hearing Association, speech language pathologists earn an average of \$39,950 per year; the median annual salary for full-time certified audiologists is about \$29,000. Those with a number of years of experience earn about \$50,000.

Education and Training ♦ Both occupations require a master's degree to be licensed in North Carolina.

HOTLinks ♦ American Speech-Language-Hearing Association, www.asha.org
♦ American Academy of Audiology, www.audiology.org

Chiropractic Medicine

Chiropractor

Chiropractors, also known as doctors of chiropractic medicine (DCM), diagnose and treat patients whose health problems are associated with the body's muscular, nervous and skeletal systems, especially the spine. Chiropractors believe that interference with these systems impairs normal functions and lowers resistance to disease. They believe that spinal or vertebral dysfunctions alter many important bodily functions by affecting the nervous system.



CAREERPrep

How can I find a college that's right for me?

(continued from page 28)

Before making a final decision, consider:

- 1. Location.** How far will I be from home? Is the college urban, metropolitan or rural?
- 2. Type and Size.** Is the institution public or private? Co-ed or single sex? Liberal arts? What is the student population? Faculty to student ratio?
- 3. Cost and Financial Aid.** What is the in-state and out-of-state tuition? Cost of room, meals, books, supplies? Student fees? What types of financial aid are available? Scholarships?
- 4. Support Services.** What's available: specialized libraries, computer and science labs, a learning resources center? What is the quality of counseling and advising services?
- 5. Admission Requirements.** What high school courses, grade point averages and admission tests are required?
- 6. Overall environment.** What's happening there? Cultural events and activities? Predominant race, ethnicity and religious beliefs of other students? Athletic teams, intramural sports, health science clubs, fraternities, sororities, and other student organizations?

Deciding on a college that best suits your academic and personal needs will greatly enhance your ability to reach your career goals, so take the time to work through these valuable steps!

MONEY

How can I plan to pay for college while still in high school?

First, learn how to manage money! Education after high school requires tuition. Tuition is what community colleges, colleges and universities charge to teach you. But you also have to buy books and office supplies, laboratory supplies and more. Living away from home involves the cost of a dormitory room or apartment, food, clothes, toiletries, bed linens, washing clothes and transportation to and from home, maybe even to class. Learning how to manage money is a major key to personal success. Incorporate these tips into your planning.

- Start a savings account and begin the habit of saving a percentage of money received from work, gifts or allowance. You may have to pay for some or all of your post-secondary education from your savings or by working and carefully managing your money, so save all that you can for your education.

- Don't use credit cards. Many students finance part or most of their education from scholarships and educational loans. Some schools may not allow you to attend if you have a poor credit history.

- Perform well in school so that you can qualify for scholarships and grants.
- Discuss your funding plans with family, guidance counselors and teachers.

(continued on page 31)

Nursing

Salary ♦ Chiropractors earn an average \$75,000 a year, according to the American Chiropractic Association. The top 10 percent earners in the field make at least \$150,000.

Education and Training ♦ To enter a chiropractic college in the U.S., you will need a minimum of two years of pre-chiropractic college with a prescribed science content. Typical prerequisites include biology, zoology, general or inorganic chemistry and related lab work. State licensing boards require a four-year chiropractic college course following at least two years of undergraduate education. All states recognize academic training in programs accredited by the Council on Chiropractic Education.

HOTLinks ♦ American Chiropractic Association, www.americhiro.org
♦ International Chiropractors Association, www.chiropractic.org
♦ National Association for Chiropractic Medicine, www.chiromed.org

Nursing

Anesthesiology



Anesthesia is the use of special drugs that temporarily block sensation in an area of the body or enable a patient to be kept unconscious and pain free during surgery. Anesthesia is administered by either an anesthesiologist (a physician who specializes in this area of practice) or a **certified registered nurse anesthetist** (CRNA, a registered nurse (RN) who is specially trained in anesthesiology). As a key member of the operating team, the CRNA combines professional nursing skills with the science of anesthesia and works in collaboration with a doctor or dentist to administer and monitor anesthesia.

Salary ♦ In 1997, the average median salary for certified registered nurse anesthetists was \$82,000. For that year, CNRAs earned the largest income of any advanced practice registered nursing group.

Education and Training ♦ Programs in nurse anesthesia are opened to licensed registered nurses with a bachelor's degree and at least one year of nursing experience. Programs range in length from two to three years. A national certification exam is required.

HOTLinks ♦ American Association of Nurse Anesthetists, www.aana.com
♦ North Carolina Association of Nurse Anesthetists, www.ncana.org
♦ American Academy of Nursing, www.nursingworld.org/aan
♦ American Nurses Association, www.ana.org

Midwifery

Certified nurse midwives (CNMs) are RNs with advanced training in midwifery, which allows them to care for healthy expectant mothers and to provide a range of clinical services for women. They examine women during pregnancy, manage labor, deliver infants and, after birth, care for the newborn and mother.

Salary ♦ In 1996, certified nurse-midwives earned an average of \$70,100 per year.



Social Work

Education and Training ♦ Any registered nurse may seek certified nurse-midwife status. A certification program involves up to 12 months of training, while a master's program usually takes two years.

HOTLinks ♦ American College of Nurse-Midwives, www.midwife.org
♦ American Academy of Nursing, www.nursingworld.org/aan
♦ American Nurses Association, www.ana.org

Nurse Practitioner

Nurse practitioners (NPs) are registered nurses who perform some of the tasks normally performed by doctors. Depending on the area where they work, nurse practitioners may prescribe certain medications, set simple fractures, suture wounds, treat minor illnesses such as the flu or an ear infection, perform regular check-ups of healthy babies and children, give health and disease prevention counseling, and refer patients to community health services. An NP may specialize in adult health, family health, school health, pediatric health, gerontological health, acute care, women's health, etc.



Salary ♦ Nurse practitioners earn around \$60,000 per year. As nurse practitioners gain experience, they can expect to earn as much as \$80,000 per year. Salaries vary widely according to years of experience, specialty and geographic location.

Education and Training ♦ A licensed RN may or may not need hands-on experience to be accepted into a nurse practitioner training program. Those accepted will usually receive a master's or equivalent degree upon completion of the program. The national certification exam is individualized by specialty.

HOTLinks ♦ American Academy of Nurse Practitioners, www.aanp.org
♦ American Academy of Nursing, www.nursingworld.org/aan
♦ American Nurses Association, www.ana.org

Social Work

Social Worker

Social workers counsel and help people to understand and solve personal and social problems. They may work with individuals, families or other social groups. These problems may include inadequate housing, unemployment, lack of job skills, financial distress, serious illness or disability, substance abuse, unwanted pregnancy, or antisocial behavior. Social workers also assist families that have serious conflicts, including those involving child or spousal abuse. There are three main types of social work: **case work**, which is face-to-face involvement with individuals or families; **group work**, which involves rehabilitation and recreation, working in areas like housing projects, hospitals, institutions and schools; and **community organization work**, which involves taking on the concerns of a whole community. Social workers can specialize in many fields, including

- child welfare and family services
- child or adult protective services
- mental health
- health care



MONEY

How can I plan to pay for college while still in high school?

(continued from page 30)

Read books and articles and research the Internet to find out how best to finance your post-high school education.

A word of caution: **You do not need to PAY anyone to find aid opportunities for you!** Some students pay hundreds of dollars to enroll in a "search." You can get the same information for free if you're willing to do the legwork. In some cases, the only information you will receive is that you are eligible for a Stafford loan.

- Look for ALL possible sources of aid. You may qualify for a scholarship or award from your home country or from a church or civic organization to which you or your parents belong.
- Learn how to apply for financial aid. You should know the difference between a federal loan and a private loan or between a scholarship and a grant-in-service. The process can quickly become frustrating so learn the basics.
- Apply for aid at every school to which you are applying for admission, even before you're accepted. Some schools will make you prove you can pay before accepting you. Even if a school doesn't ask you to prove an ability to pay, you don't want to play catch-up when you have your acceptance letter in hand. You might find yourself in a bad position and have to defer your acceptance for a year.

What is the difference between a loan and a grant?

Most students qualify for some combination of grants and loans. Grants are "gift money," something that you don't pay back. Scholarships, too, are gift money, but there is usually some academic performance standard that is associated with a scholarship —not so with a grant. Loans are funds you borrow with the promise that you will pay the sum back with interest; currently, most loans are available at about a 7% annual percentage rate. Some loans carry a federal subsidy which means that no interest accrues on the loan while a student is in school. An unsubsidized loan and a non-subsidized loan each begin to accrue interest from the date of disbursement. With most loans, a student can defer payment until at least six months after leaving school. You may have opportunity to complete work service and have an educational loan "forgiven." Undergraduate students are automatically considered for Pell Grants and State Education Opportunity grants when they file the FAFSA. If a school really wants to recruit a student, it may offer that student a large gift award as an "incentive" to attend. These are frequently not need-based, so you may not have to apply to receive one.—

Health Communication

- school social work
- criminal justice
- gerontology
- occupational social work
- medical social work
- policy/planning

Salary ♦ The Bureau of Labor Statistics report that social workers with a master's degree earn an average of about \$35,000 a year, while social workers with a bachelor's degree earn about \$25,000. Social workers in the federal government can earn well over \$40,000 a year. Salaries vary widely depending on degree, years of experience, geographic location, specialty and employer.

Education and Training ♦ A bachelor's degree in social work is the minimum required to work in this field. However, many social workers complete master's and doctoral degrees in order to compete for better jobs and even teach social work at universities.

HOTLinks ♦ National Association of Social Workers, www.naswdc.org

- Clinical Social Work Federation, www.cswf.org/info.html
- Society for Social Work Leadership in Health Care, www.sswlhc.org

PS. Have you thought about...

Health Information Management

Health information management (HIM) professionals are the experts who secure, analyze, integrate and manage information that steers the healthcare industry. The HIM field is made up of a variety of professionals including health information administrators, health information technicians, medical informatics professionals and coding specialists. HIM professionals design, implement and maintain automated and manual health information systems, determine policies and develop departmental budgets. HIM professionals can specialize in many fields, including:

- information systems design and analysis
- risk management
- quality management
- coding and third party reimbursement
- tumor/cancer or trauma registry
- computer software sales
- health management consulting
- utilization review and management

Salary ♦ According to the American Health Information Management Association, HIM department directors earn between \$30,000 and \$80,000 a year; assistant department directors, \$25,000 to 65,500 a year; consultants, \$25,000 to \$100,000 a year; clinical coders, \$22,000 to \$55,000. Starting salaries for medical informatics professionals are as follows: computer aides, \$27,000; computer programmers, \$26,000; computer systems analysts, \$30,000. Salaries vary widely depending on education, years of experience, specialty and employer.

Education and Training ♦ Most health information technicians complete a two-year associate degree program at a community college, while health information administrators must earn a bachelor's degree in an accredited health information management program. Coursework includes medical terminology, human disease, statistics, health care law and computerized health information systems administration and management.

HOTLinks ♦ American Health Information Management Association, www.ahima.org



Health Communication

- ◆ American Medical Informatics Association, www.amia.org
- ◆ International Medical Informatics Association, www.imia.org

Biological Photography

Biophotographers produce photographs, films and videotapes of medical and biological topics such as surgery, scientific experiments and medical procedures. These images are used in medical journals, training materials, textbooks, research reports and publications. A biological photographer can specialize in:

- photomicrography
- ophthalmic photography
- dental photography
- autopsy and specimen photography
- cinematography
- digital photography
- operating room photography



Salary ♦ In 1996, the average salary for a full-time photographer was \$30,600. Salaries will vary widely depending upon specialty and employer. In most cases, earnings increase with additional education or a reputation established by working in the field for several years.

Education and Training ♦ Formal training programs offered by colleges, community colleges or technical institutes average two to four years. Undergraduates majoring in photography should include coursework in scientific photography.

HOTLinks ♦ BioCommunications Association, www.bca.org
♦ Health Sciences Communications Association, www.hesca.washington.edu

Medical Illustration

Medical Illustrators are artists who create graphics to meet the requirements of communication media for the biosciences. Their work may be used in publications, film, television, textbooks, exhibits and web design or used to create three-dimensional models for scientific teaching. Medical illustrators must be accomplished in drawing, painting and modeling techniques as well as experienced in the media and materials used in commercial art. Medical illustrators can specialize in a variety of areas, including surgery, veterinary illustration and animation.



Salary ♦ In 1996, full-time visual artists earned an average of \$27,100, however, this figure can be deceiving. Salaries for medical illustrators vary widely depending on education, years of experience, computer software knowledge, employer, established reputation and more.

Education and Training ♦ A master's degree from an accredited institution is generally required for most positions in medical illustration. Applicants to graduate programs in medical illustration are required to submit a comprehensive portfolio of their work as part of the admissions process.

HOTLinks ♦ Association of Medical Illustrators, www.medical-illustrators.org
♦ Health Sciences Communications Association, www.hesca.washington.edu

MONEY

What's the difference between a scholarship and a grant-in-service?

Scholarships and grants are freebies—awards usually based on academic merit and career choice. You don't have to pay them back. A grant-in-service, however, is a contractual obligation between a student and a funding agency. Here's how a grant-in-service usually works: A funding agency pays a student's tuition and, in return, the student agrees to work for the funding agency for one to two years upon completion of college study. If the student fails to uphold her contractual obligation, however, the funding agency has the right to charge her the total cost of tuition at a markedly high interest rate.

If you're willing to put your knowledge and skills to work in an underserved community upon graduation (which, as a minority underrepresented in the health professions, you should strongly consider) then a grant-in-service is indeed a smart choice. The U.S. Armed Forces will also pay for schooling in exchange for service.

MONEY

What's the difference between in-state and out-of-state tuition?

At a state-supported school, there is always a difference in the cost of tuition for a state resident (in-state) and a non-resident (out-of-state). The differences between these can be quite large. For example, at the UNC School of Medicine, an in-state student pays tuition of \$2552, while an out-of-state resident pays \$23,444. This difference in tuition shows greater tax payer support for residents. There is usually no difference for in-state and out-of-state rates for students at private schools, such as Duke.

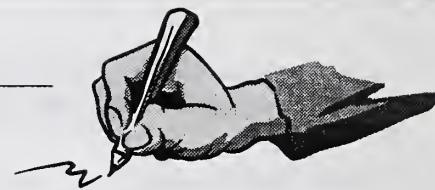
Online Resources

The Financial Aid Information Page

www.finaid.org

The Grandaddy of financial aid information, the FinAid Page is deemed "the most comprehensive free resource for objective and unbiased information about student financial aid on the World Wide Web." Created by Mark Kantrowitz, author of *The Prentice Hall Guide to Scholarships for Math and Science Students*, this Web site provides a wealth of information on how to finance a college education. Imbedded: **Financial Aid for Minority Students** consists of financial aid databases, award programs, software, advice and assistance and books on financial aid specific to minority students.

Health Communication



Scientific Writing

Scientific, medical or technical writers research, organize, write and edit scientific and technical material included in reports, proposals, speeches, articles for scientific journals and instruction manuals. These writers may translate complex medical terminology and jargon into language lay people can understand. Many medical writers and editors are trained journalists who write or edit health-related books, magazines, articles and brochures.

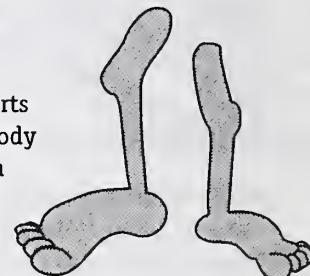
Salary ♦ Scientific, medical and technical writers earn far more than the average writer. In 1996, scientific, medical and technical writers earned an average of \$44,000 a year. Writers with journalism, communications or English degrees in addition to a science degree, or those with an advanced master's or doctoral degree, generally earn a significantly greater salary.

Education and Training ♦ An undergraduate degree in journalism or English is a must. Scientific writers must also possess a thorough understanding of technical and scientific terminology.

HOTLinks ♦ National Association of Science Writers, www.nasw.org
♦ American Medical Writers Association www.amwa.org
♦ Health Sciences Communications Association, www.hesca.washington.edu

Orthotics and Prosthetics

Orthotists specialize in planning, making and fitting orthopedic braces and similar devices such as surgical supports and corrective shoes. These are used to support weakened body parts or to correct physical defects. Prosthetists specialize in planning, making and fitting artificial limbs. An individual can be both an orthotist and a prosthetist. Both specialties require good manual dexterity, the ability to make things through sculpting and other skills.



Salary ♦ Average starting salaries: certified orthotist: \$34,000; certified prosthetist: \$37,000; certified orthotist/prosthetist: \$44,000.

Education and Training ♦ There are two ways to become an orthotist/prosthetist and two levels of certification. Registered technicians are trained on the job (training usually takes three to four years) and must pass a certification exam. Certified orthotists, prosthetists and orthotists/prosthetists have earned a bachelor's degree and must also pass a certification exam.

HOTLinks ♦ American Academy of Orthotists and Prosthetists, www.oandp.com/organiza/aaop/index.htm
♦ National Commission on Orthotic and Prosthetic Education, www.ncope.org

Special Health Services and Technologies

How about these?

Emergency Medical Technician



Emergency Medical Technicians (EMTs) are members of the emergency medical care team. They use their knowledge and skills to provide basic and advanced life support to seriously ill or injured patients before these patients reach the hospital. They are involved in patient rescue and they transport patients by ambulance or aircraft to appropriate medical centers.

Salary ♦ EMT-Paramedics earn a starting salary between \$19,000 and \$27,000 a year.

Education and Training ♦ EMTs complete a 110-hour training program at a community college, university or municipal county emergency medical service organization. Certification exams are required.

HOTLinks ♦ National Association of Emergency Medical Technicians, www.naemt.org
♦ National Registry of Emergency Medical Technicians, www.nremt.org

Perfusionist

Perfusionists are trained to operate special equipment that temporarily takes over a patient's respiratory (breathing) and/or circulatory (blood movement) functions. This ensures that oxygen reaches the patient's body through the blood, even when the patient's lungs and heart are temporarily not functioning.



Salary ♦ Perfusionists earn between \$40,000 and \$70,000 a year.

Education and Training ♦ Training takes one to two years depending on program design and student's qualifications. All programs require either a bachelor's degree prior to admission or award a bachelor's degree upon completion of the program. Most programs prefer an applicant posses prior training in medical technology, respiratory care or nursing. A certification exam is required.

HOTLinks ♦ American Board of Cardiovascular Perfusion, www.abcp.org
♦ American Academy of Cardiovascular Perfusion,
<http://users.aol.com/officeaaacp>
♦ American Society of Extra-Corporeal Technology, www.amsect.org

Surgical Technologist

Surgical technologists work in the operating room, helping to provide a safe, sterile environment and adding to the efficiency of the operating room team. Surgical technologists prepare surgical instruments and materials using sterile techniques. They may also prepare patients for surgery.



Salary ♦ Surgical technologists earn around \$25,000 a year.

Education and Training ♦ Programs in North Carolina vary in length from nine to twelve months. A certification exam is required.

HOTLink ♦ Association of Surgical Technologists, www.ast.org

MONEY

Online Resources

The Student Guide

[www.ed.gov/prog_info/
SFA/Student Guide](http://www.ed.gov/prog_info/SFA/Student%20Guide)

Produced by the U.S. Department of Education, the electronic version of the Student Guide 1998-99, covers the Department's major aid programs, including Pell Grants, Stafford Loans and PLUS loans. About 70 percent of all student aid comes from the programs discussed in the Guide. Contents include tips on how to choose a school, general information on eligibility and special circumstances, borrower responsibilities and rights and more. If you prefer the written document, it's free. Write to:

Federal Student Aid
Information Center
P.O. Box 84
Washington, DC
20044-0084

or call 1-800-4-FED-AID
(1-800-433-3243)

U.S. News and Report Education Online

[www.usnews.com/
usnews/edu/home.htm](http://www.usnews.com/usnews/edu/home.htm)

U.S. News can help you locate scholarships, predict college costs and compare financial aid awards in addition to helping you find a college, community college, graduate or professional school. (They'll compare different schools for you too.) An on-line counselor is available to answer all your financial aid and career planning questions. Bookmark it!

About NC-HCAP

North Carolina Health Careers Access Program located at the University of North Carolina at Chapel Hill

Mission

To increase the number of individuals from educationally or economically disadvantaged backgrounds, with an emphasis on under-represented minorities (African-Americans, Native Americans, Hispanics and Latinos, Asians/Pacific Islanders of the Vietnam War Era), who are trained, educated, and employed in the health professions. NC-HCAP does this by:

- increasing awareness of career opportunities in the health professions,
- cultivating interests in pursuit of health professions,
- enhancing opportunities to gain access to formal training and education programs in the health professions, and
- increasing the probability of success in completing formal training and education programs in the health professions.

Program Components

▲ Health Careers Centers

Health Careers Centers offer campus-based activities to identify, recruit, motivate, and strengthen the academic and basic skills backgrounds of underrepresented minority and disadvantaged students for health training and professional health programs. Other support activities include identifying financial aid resources and providing advocacy service for admission to graduate and health professions schools.

Health Careers Centers are located on the campuses of **Elizabeth City State University** in Elizabeth City, NC; **North Carolina Central University** in Durham, NC; and **University of North Carolina at Pembroke** in Pembroke, NC.



■ The Statewide Health Careers Information Network

The Network provides an abundance of information on health careers, health professions programs, financial aid resources for health professions programs, health sciences recruitment and enrichment activities, and more.

How to reach us

North Carolina Health Careers Access Program
University of North Carolina at Chapel Hill
CB# 8010 • 301 Pittsboro Street, Suite 351
Chapel Hill, NC 27599-8010

Phone: (877) 962-4227 (toll-free)
FAX: (919) 966-6109
E-Mail: nchcap@email.unc.edu
Web: nchcap.unc.edu

● Clinical Health Summer Program (CHSP)

CHSP is a seven-week (40 hours per week) experiential learning opportunity held each year from May through July for underrepresented minority and disadvantaged students accepted to or enrolled in a health science or health related curriculum at Elizabeth City State University, North Carolina Central University or the University of North Carolina at Pembroke. CHSP consists of both clinical experiences in health care agencies and academic enrichment experiences provided by NC-HCAP Health Careers Centers. Participants are paid at or above minimum wage.

▲ Health Careers Information & Enrichment (HCIE) Workshops

The HCIE Workshop is a hands-on outreach program for minority and disadvantaged students (elementary, middle and high school) and parents on health careers, financial aid, academic skills, and youth-oriented health issues. HCIE Workshops are designed to increase the interest, number, and motivation of underrepresented students considering a career in the health professions.

The Health Professions Forum and Science Enrichment Preparation Program described below make up NC-HCAP's Health Professions Preparation Program.

■ Health Professions Forum

HPFs are held twice during the academic year on the campuses of various North Carolina colleges and universities. Forums give students opportunity to learn about different health professions programs available in North Carolina. Students can also talk one-on-one with both health science students and health program representatives. Health Professions Forums are free and open to all students, primarily freshmen and sophomores, interested in pursuing a career in the health sciences.

● Inspirational Speakers in Science (ISIS) Lecture Series

Held once each academic year in conjunction with the Health Professions Forum, the ISIS Lecture Series exposes secondary and undergraduate college students to African-American, Native American and Latino/Hispanic health professionals and scientists of national prominence. ISIS lecturers draw upon personal experiences to demonstrate how they overcame many of the obstacles often faced by students of color in reaching their educational and professional goals.

▲ Science Enrichment Preparation (SEP) Program

SEP is an eight-week, honors level, science enrichment program for minority and economically disadvantaged college students (primarily rising sophomores and rising juniors) who want to enter schools of allied health, chiropractic, dentistry, medicine, optometry, osteopathy, pharmacy, podiatry, public health, and veterinary medicine. Students receive a total of 150 contact hours in physics, organic chemistry, human physiology, quantitative skills/biostatistics. Courses in reading speed and comprehension, effective admissions test taking strategies, and interview and study skills are woven into the curriculum, along with site visits to area health care and biomedical research facilities.

Produced by
North Carolina Health Careers Access Program
University of North Carolina at Chapel Hill
CB# 8010 • 301 Pittsboro Street, Suite 351
Chapel Hill, North Carolina 27599-8010

Phone: (919) 966-2264
Fax: (919) 966-6109
Web: nchcap.unc.edu



1,200 copies of this document were printed at a cost of \$1696 or \$1.41 per copy

© 2001 North Carolina Health Careers Access Program
University of North Carolina at Chapel Hill